

# How independent are the variants of a linguistic variable?

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# The notion of *variable* in sociolinguistics

- conditioned/variable rule/process (type 1,  $A \rightarrow B$ )
  - inside grammar: conditioned/variable rule
  - outside grammar: conditioned/variable process
- conditioned choice/competition (type 2,  $A$  vs.  $B$ )
  - different from above? replaces? supplements?
  - what's competing? (sometimes not clear in a single case)  
phonemes, morphemes, functional heads, grammars?
  - where's the competition (is it different in different cases?)  
during derivation? after? how much competes? with what?
- the linguistic variable as “heuristic device” (Labov, 1978).
  - we give up? or we can't tell what is going on “down below”?
  - this is strange, because LV often seems “real” enough
  - we will return to the linguistic variable...

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# Method in variationist sociolinguistics

- a new (better) type of data
  - the sociolinguistic interview preceded variable rule analysis
  - earliest quantitative methods (Labov, 1963, 1966) simpler
- codification of data analysis principles
  - principle of accountability
    - (“the linguistic variable” from a methodological POV):
 

any variable form (a member of a set of ways of “saying the same thing”) should be reported with the proportion of cases in which the form did occur in the relevant environment, compared to the total number of cases in which it might have occurred (Labov, 1972)
- fixation of a standard method of data analysis
  - additive model, multiplicative models (c. 1969 - 1974)
  - logistic model (matches other fields, 1975 - present)
- method (multiple logistic regression) constrains data
  - possible data: cell proportions or individual binary tokens

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# What the standard method can tell us

- assuming a variable of type 1 ( $A \rightarrow B$ ) or type 2 ( $A$  vs.  $B$ )
- standard approach quantifies constraints on the variation (size and significance of predictors of various types)
- superficial inverse pattern (what favors  $A$  disfavors  $B$ , what favors  $B$  disfavors  $A$ )
- type 2 ( $A$  vs.  $B$ ): inherently inverse pattern
- type 1 ( $A \rightarrow B$ ): it depends
  - imagine  $XAY \rightarrow XBY$
  - if the output  $XBY$  does not affect rule application
    - what disfavors/favors  $A$  favors/disfavors  $A \rightarrow B$
    - what disfavors/favors  $B$  does not affect  $A \rightarrow B$ !
  - if both input  $XAY$  and output  $XBY$  affect rule application
    - inherently inverse pattern; indistinguishable from type 2?

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# What the standard method can't tell us

- can't distinguish type 1 (rule) from type 2 (choice)
  - sometimes we must be dealing with a choice  
e.g. when variants cannot be related by a rule
  - harder to say that we ever *must* be dealing with a rule  
not about to solve! rules vs. constraints in categorical phon.
- can't distinguish type 3 (independence of variants)
  - what favors/disfavors A may not affect B (and vice versa)
  - inherent non-inverse pattern (in use, a choice may be forced)
  - can't be detected by standard method of proportions
  - nor by experimental method of Bresnan (2007)  
(subjects distribute 100 rating points between variants)
- *Goal of this talk:*
  - Demonstrate that variants can behave independently as revealed through acceptability ratings

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# What the standard method can't tell us (nor this talk)

- variation and change in absolute frequency
  - of one variant: noticed, not recognized (related to this talk)
  - of both variants in parallel: invisible to standard method
- pushing envelope of variation (where accountability ends)
  - still worth thinking about LV and which variants belong
- variation and change in single items (not variants)
  - such items can still be interesting, even grammatical
  - can study raw frequencies (corpus lx) or Poisson regression
- we look for decades at “ways of saying the same thing”  
but never at “similar ways of saying a similar thing”?

## (1) *Particle verb alternation*

- a. Bob threw his keys in.
- b. Bob threw in his keys.
- c. Bob threw his keys in the drawer.
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Section 2. The independence debate: Previous work on the independence of variants.

Section 3. Methods

Section 4. Results & Discussion

Section 5. Conclusion

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# A (partial) discussion of (partially-)related research

- this is a very incomplete discussion (we suspect)
  - please let us know of other research touching on these issues!
- speaker-rating approaches
  - experiments where the choice of variant is among IVs
  - and the DV is some kind of rating of the speaker
- psycholinguistic approaches
  - asymmetrical persistence patterns (not RT priming)
  - not sure if results have been (or could be) interpreted as evidence for variant independence
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# Speaker-rating approaches

- (Labov et al., 2011)
  - “Properties of the sociolinguistic monitor”
    - judging professional suitability based on LV (ING)
    - given the formal context, -in’ is marked, -ing is expected
    - logarithmic pattern: each additional -in’ has less effect
    - makes sense, but turn it around (or imagine production), social factor not related to LV in (symmetric) logistic way
- (Campbell-Kibler, 2011)
  - “The sociolinguistic variant as a carrier of social meaning”
    - rating on a range of social attributes based on (ING)
    - three guises: [ɪn], [ɪn], and [obscured by noise]
    - we can observe independence: “difficult or impossible to detect through methods that contrast one variant against the other” (435)
      - -ing: intelligent, educated, articulate, not a student
      - -in’: casual, not gay
    - independent social meanings because it’s two morphemes?
    - affects (third-wave) concept of LV?

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- (Tamminga, 2014)
  - “Persistence in the production of linguistic variation”
    - use of one variant favors use of the same variant again
    - depends on many things (time, grammatical similarity...)
- persistence asymmetries (not all classic variables)
  - BP: non-marking inflection stronger effect than marking it
  - English: passive stronger than active, -in’ stronger than -ing
  - AAVE: 3sg zero stronger than 3sg -s (inanimate prime)
  - generalization: “inverse frequency effect” (expectation)
- does it suggest we don’t *just* store/attend to proportions?
  - given 10% A, 90% B, “surprise” at A requires proportions
  - yet over time, knowing proportion, how could A “surprise”?
- (Loudermilk, 2013) measured “N400-like” potentials (EEG)
  - those for m affected by (ING) use in preceding context\*
  - those for m<sub>j</sub> not affected

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# Acceptability approaches

- (Grondalaers and Speelman, 2008): “Constructional near-synonymy, individual variation, and grammaticality judgments: Can careful design and participant ignorance overcome the ill reputation of questionnaires?”
- since appropriate corpus not available, “we have no choice” but to elicit grammaticality [sic] judgments (7-point scale)
  - (2) In de asbak lag (er) een hagelkorrel.  
In the ashtray lay there a hailstone.  
‘In the ashtray was a hailstone.’
- sentences without *er* get worse with certain factors:
  - vague locative: -0.41    temporal: -0.98    verb *zijn*: -1.06
- sentences with *er* do not get better with same:
  - vague locative: -0.01    temporal: -0.03    verb *zijn*: -0.24
- makes sense if *er* is for repair, but no inverse pattern
- variants *er* and zero - if they are variants - are independent

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# Tentative summary

- most linguistic variables affected by both social factors (have social meaning) and linguistic factors (more obscure)
- social meanings are complex and (following C-K) it may be unsurprising for them to attach to individual forms
- cf. Labov: overt comment attaches to individual forms, rarely to alternations, distinctions, mergers, proportions
- linguistic factors appear to be of two types
  - 1 where we think the association is arbitrary/historical
    - example: (ING): [ɪŋ] more nominal, [ɪn] more verbal
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# Experiment 1: Object ordering effects in Norwegian

- 500 subjects (.01% of population of Norway, age 18-81, mean 39)
- 2x3 design,
- 4 items/condition

Context	theme-goal	goal-theme
<b>Passives</b>	Den ble gitt ham. 'It was given him.'	Han ble gitt den. 'He was given it.'
<b>Active OS</b>	Elsa ga den ham ikke. 'Elsa didn't give it him.'	Elsa ga ham den ikke. 'Elsa didn't give him it.'
<b>Active-non-OS</b>	Elsa har ikke gitt den ham. 'Elsa hasn't given it him.'	Elsa har ikke gitt ham den. 'Elsa hasn't given him it.'

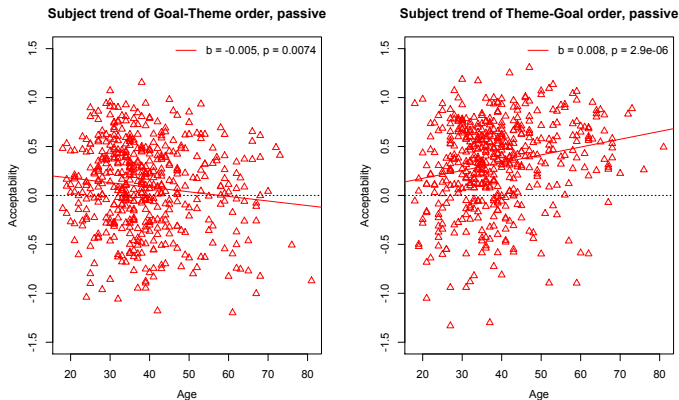
Table 1: Example sentences for six conditions



# Data analysis methods

- normalize responses
  - for each subject, get mean/s.d. of fillers (ranging OK to \*)
  - for each response (0-10), creating z-score using mean/s.d.
- adjust responses, removing lexicalization-specific effects
  - fit maximal mixed-effects model (lme4 package)
    - within-speaker fixed effects: e.g. order, object weight
    - intercept/all slopes by subject and by lexicalization
  - subtract lexicalization effects, keep fixed and subject effects

# Diachronic effects: Norwegian passives



**Figure 1:** Acceptability of goal-theme (*Han ble gitt den*) and theme-goal (*Den ble gitt han*) word orders in the passive, by speaker

# Diachronic effects: Norwegian passives

- Mirroring slopes for the effect of age is exactly the pattern we expect if grammatical change reflects incremental change in the probability of choosing one abstract representation vs. a competing one—“grammar competition” in Kroch’s (1989; 1994) terms.
- But such isn’t always the case . . . .

# Introduction to the particle verb alternation

(3) Kim cut the melon open. [VOP]

(4) Kim cut open the melon. [VPO]

- two effects identified long ago - in choice paradigm:
  - ‘light’ object favors VOP, ‘heavy’ object favors VPO
  - ‘old’ object favors VOP, ‘new’ object favors VPO
- two effects identified in our work - in choice paradigm:
  - UK subjects favor VOP, US subjects favor VPO
  - younger subjects favor VOP, older subjects favor VPO
- recent literature
  - Gries (2001, 2003): broad multi-factorial approach to alternation
  - Cappelle (2009): ‘contextual’ factors affecting alternation
  - Larsen (2014): syntax of alternants (not alternation)



# Explaining these effects and predicting acceptabilities

- the ‘social effects’
  - little “social meaning” (this variable has very low salience)
  - any associations likely arbitrary - variant independence?
- the effect of object weight
  - head-initial Ls: “end-weight” (Behaghel, 1909; Quirk et al., 1972).
  - heavy middle item hard to process (Hawkins, 1995, 2004; Lohse et al., 2004).
  - implies effect on VOP only - or (following above) inverse?
- the effect of object newness
  - in English: old/topic before new/focus (19th c., Prague School)
  - high-level effect, predicts inverse pattern (?):
    - VPO order - new object > old object
    - VOP order - new object < old object
  - unless only real effect is \*LATE-OLD (or \*EARLY-NEW)
    - in that case, predict variant independence:
      - only one order would be affected by old/new manipulation

## Experiment 2: Weight effects on the particle verb alternation

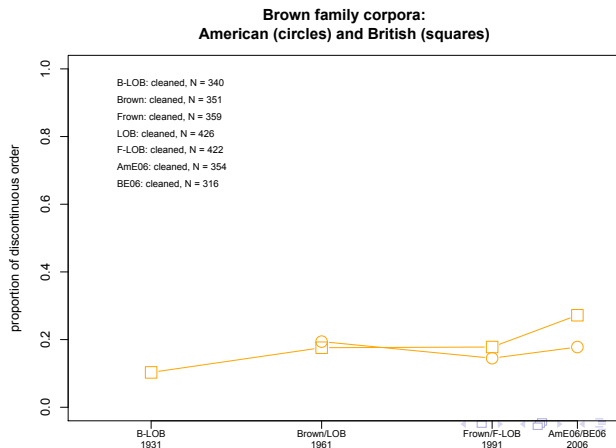
- 113 US vs. 126 UK subjects, age 18-84 (mean 30)
- crossed: order, object weight (3 vs. 7 syllables), *object focus*
- *object focus* removed: ‘old object’ made all ratings go down

Object Weight	Verb-Object-Particle	Verb-Particle-Object
<b>Light</b>	... <i>cut the melon open</i>	... <i>cut open the melon</i>
<b>Heavy</b>	... <i>cut the heavy juicy melon open</i>	... <i>cut open the heavy juicy melon</i>

Table 2: Four conditions

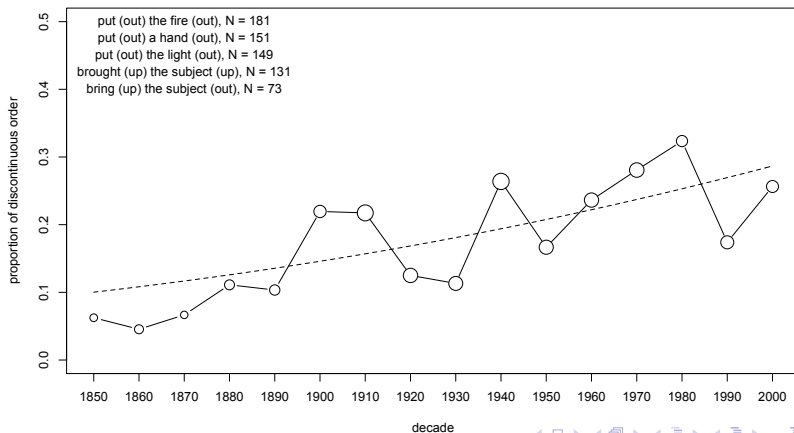
# Diachronic effects: English particle verbs

- Corpus-based evidence of change toward VOP orders (Johnson et al., 2013).



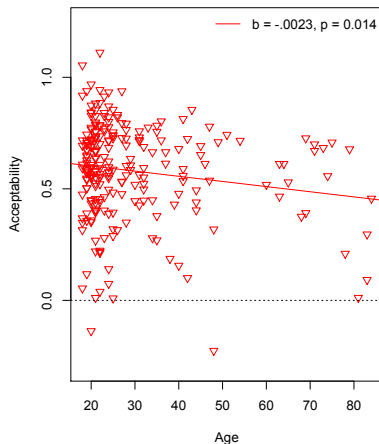
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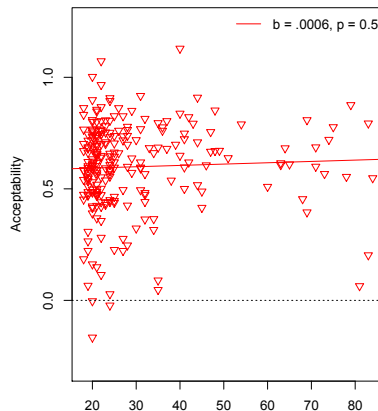


# Diachronic effects: English particle verbs

Subject trend of VOP order



Subject trend of VPO order



# Diachronic effects: English particle verbs

- Figure 6 shows that this change has co-occurred with an apparent time increase in the acceptability of the VOP order, but no significant change in the acceptability of the VPO order.
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- Why some processes of change, but not others, should be well-behaved – from the perspective of the competition model – we can't answer.

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# Particle verbs: Object Length

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Table 3: Four conditions

# Particle verbs: Object Length

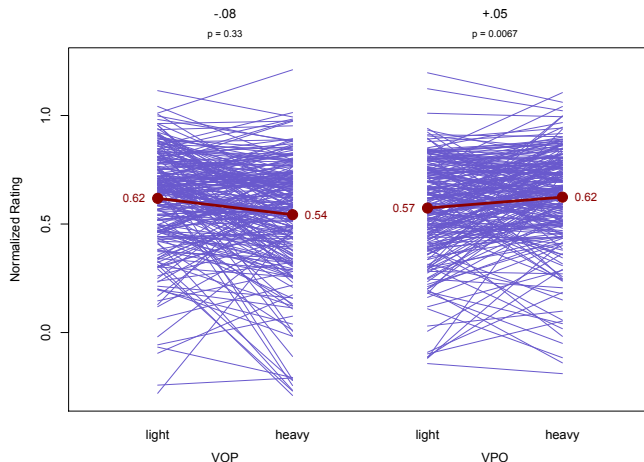


Figure 5: Weight effects for four conditions

## Particle verbs: Object Length

- If we call this a mirror pattern, it is only partial.
- Increasing the weight of the object from from three to seven syllables disfavors the Verb-Object-Particle order 50% more than doing so favors the Verb-Particle-Object order.

Object Weight	VOP	VPO
Light	0.618	0.574
Heavy	0.543	0.624
$ \Delta $	-0.075	+0.050

Table 4: Average acceptability for four conditions

## Particle verbs: Object Length

- The result for the VOP order can be explained by Lohse et al.'s (2004) processing-based account. A heavier object separating the verb and particle increases the size of the verb-particle processing domain.
- For object weight to affect the VPO order is unexpected from this perspective, since a heavier final object NP should have no effect at all on the size of the processing domain for the relevant dependency relation.
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## Experiment 3: Focus effects on the particle verb alternation

- Several authors have noted subtle focus effects on particle placement. New information objects prefer the VOP order.
- Sometimes explained in terms of focus-drive movement (Kayne, 1998; Haddican and Johnson, 2014), sometimes in terms of syntax-prosody mapping (Svenonius, 1996; Dehé, 2002).

(5) Q: Who will you pick up? (Obj. focus)

A: I'll pick (?the girls) up (the girls).

(6) Q: How are Turid and Ingrid going to get here?  
(Obj. given)

A: I'll pick (the girls) up (?the girls).

(Svenonius, 1996)

# Particle verbs: Object focus effects

- 125 US subjects (age 18-52, mean 23)
- crossed: order, focus (*sentence*, VP, object, *object topic*)

(7) Q: What happened?

A: Ann cut (the tree) down (the tree). (Wide focus)

(8) Q: What did Ann cut down?

A: Ann cut (the tree) down (the tree). (Obj. focus)

(9) Q: What did Ann do?

A: Ann cut (the tree) down (the tree). (VP focus)

(10) Q: What happened to the tree?

A: Ann cut (the tree) down (the tree). (Obj. given)



# Particle verbs: Object focus effects

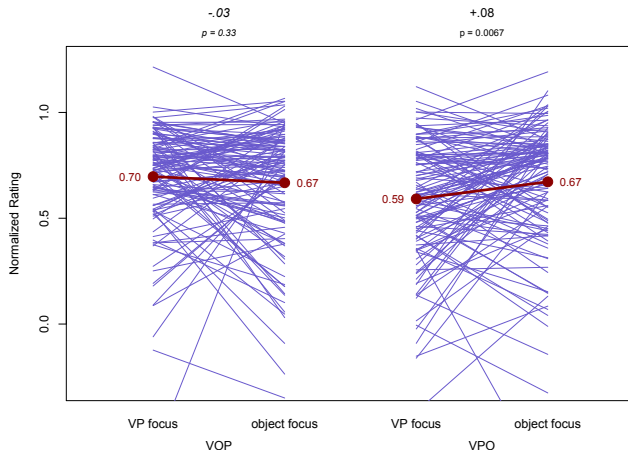


Figure 6: Focus effects on acceptability of VOP and VPO orders

# Particle verbs: Object focus effects

Object Weight	VOP	VPO
<b>VP focus</b>	0.697	0.591
<b>Obj. focus</b>	0.668	0.672
$ \Delta $	-0.029	+0.081

Table 5: Average acceptability for four conditions

- Focus has a relatively strong effect on VPO orders and (at best) a weaker effect on VOP
- None of the available theories (our previous work included) predicts that VPO orders should be more sensitive to focus effects than VOP orders.

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# Main points

- Much has been learned from the standard methodology that treats variants of a linguistic variable as choices (or the input and output of rules/processes). From this perspective, binary variants always appear to respond inversely to the factors affecting variation.
- However, in some respects variants can also behave independently.
- Our results suggest that different (w/i speaker, betw. speaker) effects one and the same variable can affect the variants independently or not.
- A predictive model of these differences should surely be a goal of variationist sociolinguistics.

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# Many thanks to ...

- Marcel den Dikken, Nanna Haug Hilton, Anders Holmberg, Meredith Tamminga



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